

Appl. No. : 10/800,814
Filed : March 15, 2004

REMARKS

In response to the Office Action mailed June 13, 2005, please reconsider the above-captioned application in light of the above amendments and the following remarks.

Amendments to Specification Correct Informalities

During review of the specification, Applicant's counsel noted several minor typographical errors. The amendments to the specification correct these informalities. No new matter has been added.

Rejections Under 35 U.S.C. § 102(b)

The Examiner rejected Claims 1-9, 12-14, 17, 18, and 27-29 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,124,208 to Burns. Applicant has made claim amendments to clarify certain limitations and to define over Burns, and Applicant submits that the claims as currently constituted are allowable. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of these claims.

Burns teaches a metal hockey stick. The hockey stick has a blade portion 11 having front and back metal outer skins 12, 13 that are made of aluminum. A metal honeycomb 14, also made of aluminum, is sandwiched between the skins 12, 13 (Col. 2, ll. 9-14). The aluminum honeycomb 14 is adhered to the skins 12, 13 by an epoxy adhesive 17. Further, an expandable foam 20 fills the honeycomb 14 (Col. 2, ll. 33-35; 44-46). The metal skins 12, 13 do not extend fully around the honeycomb 14 (Col. 2, ll. 54-57). Thus, a plastic filler 21 is used to enclose the side edges of the stick.

Burns was filed in 1977, and deals with problems discovered with wooden hockey sticks. The Burns invention was developed because wood has a tendency to crack under the impacts incident to hockey (Col. 1, ll. 10-12). Also, Burns notes that attempts to combine wood and metal have been unsuccessful. Thus, Burns contemplates an all-aluminum stick as an alternative to wooden hockey sticks. Technology has advanced tremendously since Burns was filed, and today's sports sticks, including the claimed invention, include technology far different than that of Burns. Burns does not contemplate, and has no consideration of, composite materials such as fiber-reinforced cured resins.

Appl. No. : 10/800,814
Filed : March 15, 2004

Claims 1-8, 12-14, 17 and 18

Claim 1 is an independent claim from which Claims 2-8, 12-14, 17 and 18 depend. Claim 1 has been amended to clarify certain aspects of the inventive hockey stick and to define over Burns. As amended, Claim 1 recites, *inter alia*, a hockey stick blade having an outer layer formed by at least one composite layer of fibers entrained in a cured resin, the fiber and resin composite fully enclosing a core and comprising a primary impact wall and a secondary impact wall. The core comprises a cell structure comprising a plurality of spaced apart cell walls, the cell structure being filled with an expanded foam disposed between the cell walls. Longitudinal axes of the cell walls generally extend in a direction from the primary impact wall toward the secondary impact wall. The cell walls are made of a material that is more compliant than the primary impact wall.

Claims 2-8, 12-14, 17 and 18 depend from Claim 1 and recite additional patentable subject matter, such as the primary and secondary impact walls comprising a plurality of layers of fibers; the cell walls substantially engaging the primary impact wall; a layer of foam disposed between the cell walls and the secondary impact wall; the cell structure being constructed of a material having greater ability to dampen vibrations from impacts than does the composite that forms the primary impact wall; and the blade core comprising first and second zones that have different structural properties.

Burns does not teach or suggest all of the limitations of amended Claim 1 or the claims that depend therefrom. For example, the Burns skins 12, 13 and honeycomb 14 are all made out of the same material, specifically aluminum. As such, any vibrations in the skins are transmitted readily by the aluminum, which has substantially no vibration dampening properties. Also, Burns' honeycomb 14 has the same compliance properties as do the skins 12, 13. Furthermore, Burns' metal skins do not fully enclose the honeycomb; Burns instead uses a filler to enclose the side edges. Still further, Burns does not contemplate a blade core comprising zones wherein different zones of the core have different structural properties.

Burns does not teach or suggest all the limitations of Claim 1 or Claims 2-8, 12-14, 17, and 18 which depend therefrom. As such, Applicant respectfully requests that the Examiner withdraw the rejection of these claims.

Appl. No. : 10/800,814
Filed : March 15, 2004

Claims 27-29

Claim 27 has been amended, and currently defines over Burns. As amended, Claim 27 recites, *inter alia*, a cover comprising a primary impact face and a secondary impact face that generally oppose one another, and a generally rigid elongate spine that extends between the primary and secondary impact faces along the length of the contact portion of a sports stick. An upper core and a lower core are substantially surrounded by the cover, and at least one of the cores comprises a celled structural member constructed of a different material than the cover and comprising a plurality of cell walls. The upper and lower cores are separated from one another by the elongate spine.

Claims 28 and 29 depend from Claim 27 and recite additional patentable subject matter such as the celled member being more pliable than the primary impact face; and the celled member being configured to absorb and dampen vibrations from impacts to the primary impact face.

Burns does not teach or suggest all of the limitations of amended Claim 27 or the claims that depend therefrom. For example, the Burns skins 12, 13 and honeycomb 14 are all made out of the same material, specifically aluminum. As such, any vibrations in the skins are transmitted readily by the aluminum, which has substantially no vibration dampening properties. Also, Burns does not teach or suggest a generally rigid elongate spine nor upper or lower cores as recited.

With regard to Claim 28, in the Office Action the Examiner stated that “the expandable foam would inherently be more pliable/compliant than the other layers” (Office Action, page 2). However, the cell walls referred to in the claim extend generally in a direction from the primary impact face to the secondary impact face, and are not the same as expandable foam. Accordingly, Applicant submits that the Examiner’s rejection of Claim 28 is based on an incorrect premise.

Since Burns does not teach or suggest all of the limitations of Claims 27-29 Applicant respectfully requests that the Examiner withdraw the rejection of these claims.

Rejections Under 35 U.S.C. § 103(a)

The Examiner rejected Claims 10 and 11 under 35 U.S.C. § 103(a) as unpatentable over Burns in view of U.S. Patent No. 3,970,324 to Howat. Applicant respectfully traverses this

Appl. No. : 10/800,814
Filed : March 15, 2004

rejection, and contends that there is no proper motivation to combine the Burns and Howat references, and that even if these references were combined, they do not teach or suggest all of the limitations of these claims.

The Burns all-aluminum hockey stick has one key goal: to “provide[s] a stick that is extremely durable and able to withstand severe impact loads during usage” (Col. 1, ll. 26-27). It thus appears from the Burns specification that the rigid aluminum honeycomb core is intended to directly bear the load applied to the skins 12, 13 during a hockey shot. There is no mention at all of the honeycomb’s role in bending of the stick, and, in fact, Burns does not contemplate bending. Howat, on the other hand, is directed to a ski. As would be expected, Howat makes no mention at all of impact strength, and instead deals only with bending and torquing (Col. 1, ll. 21-25). Howat uses a foam-filled cellular core only as a means to provide an adequate bond between the foam and other layers of the ski (Col. 2, ll. 9-16; Col. 4, ll. 26-30). Before Howat, there had been problems bonding unreinforced foam to layers of a ski (Col. 1, ll. 44-46).

Burns and Howat are directed to totally different goals and purposes. These references are unrelated both in product and in purpose. Although they both employ some type of celled structure, these structures are used in different ways and for different purposes.

Even if combined, the Burns/Howat combination does not teach or suggest all of the recited limitations. For example, with regard to Claim 11, the Examiner contends that Howat teaches an open-celled structure, and refers to Figures 5 and 7 to support this contention. Claim 11, which has been amended to clarify certain claim terms, requires that the cell structure comprises an open-cell structure in which at least one cell wall is not interconnected with the other cell walls. This is markedly different than what is disclosed in Howat. Specifically, in Howat, perforations 16 are formed in the cells 18 (Col. 3, ll. 28-39). Figures 5-7 show such perforations 16 through cells 18, 18A, and do not illustrate an “open-celled structure” as claimed.

Since the Burns and Howat references are not properly combined, and since, even if combined, they do not teach or suggest all of the limitations of Claims 10 and 11, Applicant respectfully requests that the Examiner withdraw the rejection of these claims.

The Examiner rejected Claims 15 and 16 over Burns, contending that these ranges would be obvious to an ordinary skilled artisan depending on certain weight/flexibility characteristics. Applicant traverses this rejection, and contends that the Examiner is misapplying Burns.

Appl. No. : 10/800,814
Filed : March 15, 2004

The problems solved by Applicant's invention did not exist at the time of the Burns device. Since Burns uses a metal honeycomb to directly bear a load applied to a metal face, Burns does not have the concern of metal delamination or the like. Rather, this delamination problem is unique to composite, fiber-reinforced hockey stick blades that include an outer composite layer that is supported by a foam core. As discussed in Paragraph [0006] of Applicant's specification, extreme shots, such as "slap shots," exert tremendous impact forces on a relatively small portion of the blade's composite outer layer. As such, during an extreme shot, the composite blade face may deform somewhat. However, since the face is supported by the foam core, impact forces are distributed. However, upon repeated impacts, the foam, which is itself unsupported, tends to crush, eventually creating a significant void behind the composite face. The composite face is thus no longer supported by the foam, and upon repeated extreme shots, will also break down, resulting in blade failure. This problem was not contemplated or identified by Burns. In fact, this problem did not exist in the technology available at the time of Burns. It was not until much later, when fiber-reinforced composite, foam-cored hockey stick blades were developed, that this problem developed. Applicant has now identified the problem, and, by the claimed invention, has substantially resolved it. As discussed in Paragraph [0050] of Applicant's specification, the cell structure 96 contains the foam within the cells, thus providing support for the foam, and enabling the foam to better resist crushing, and also containing propagation of foam crushing. As such, the foam core effectively lasts longer, creation of significant voids behind the composite faces is decreased and/or delayed, and the fiber-reinforced composite, foam core blade has markedly increased durability.

In Burns, the honeycomb material was intended to directly bear the impact load of the skins 12, 13. As just discussed, the claimed celled structure supports the foam; it provides support in a manner not contemplated by Burns. These are two totally different applications, and no artisan, based only upon Burns, could determine adequate or desired diameters of non-aluminum cells in accordance with the invention claimed in Claims 15 and 16. These ranges have been found by Applicant to provide advantageous support and containment of the foam within such a composite blade.

Appl. No. : **10/800,814**
Filed : **March 15, 2004**

Since Burns gives no guidance, and indeed is incapable of giving guidance to a skilled artisan for developing cell structure ranges as recited in Claims 15 and 16, Applicant respectfully requests that the Examiner withdraw the rejection of these claims.

The Examiner rejected Claim 19 under 35 U.S.C. § 103(a) as being unpatentable over Burns in view of U.S. Patent No. 4,504,344 to Helle. Applicant respectfully traverses the rejection, and disagrees with the Examiner's characterization of the cited art. Specifically, the Examiner states that Helle employs holes in the foam core of blades, and that such holes would inherently have air in them (Office Action, p. 3). The Examiner is correct that Helle teaches plurality of holes 7 drilled into the core 4. However, Helle also clearly teaches that a plastic is injected over the core and about the entire core. This plastic fills the holes 7, creating "small staves of polyester plastic... which extend transversely through the blade portion 3 and reinforce the same" (Col. 2, ll. 15-21). The holes 7 and the resulting staves of plastic serve substantially the same purpose as the aluminum honeycomb and aluminum skins of Burns.

Since the cited references do not teach or suggest all of the limitations of Claim 19, Applicant respectfully requests that the Examiner withdraw the rejection of this claim.

New Claims

New Claims 30-39 have been added to more fully recite subject matter that Applicant considers to be the invention. New Claims 30-35 depend from amended Claim 1 and recite additional patentable subject matter. New Claims 36-39 depend from amended Claim 27 and also recite additional patentable subject matter. No new matter has been added. Applicant submits that all of the new claims are currently in condition for allowance.

CONCLUSION

For the foregoing reasons, it is respectfully submitted that the rejections set forth in the outstanding Office Action are inapplicable to the present claims. Accordingly, early issuance of a Notice of Allowance is most earnestly solicited.

Appl. No. : 10/800,814
Filed : March 15, 2004

The undersigned has made a good faith effort to respond to all of the rejections in the case and to place the claims in condition for immediate allowance. Nevertheless, if any undeveloped issues remain or if any issues require clarification, the Examiner is respectfully requested to call Applicant's attorney in order to resolve such issue promptly.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

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By 

Glen L Nuttal

Registration No. 46,188
Attorney of Record
Customer No. 20,995
(949) 760-0404

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